

**REMARKS**

Claims 1-68 are pending in the present application. The Examiner has objected to claims 62-68. Claims 1-61 stand rejected.

**I. ALLOWABLE SUBJECT MATTER IN CLAIMS 62-68**

Applicants would like to gratefully acknowledge the indication by the Examiner that claims 62-68 include patentable subject matter. The Examiner states that claims 62-68 are merely objected to for depending from a rejected base claim. However, in view of the arguments made below, Applicants believe that claims 62-68 are in condition for allowance. It is respectfully requested that the objection be withdrawn with respect to claims 62-68.

**II. REJECTION UNDER 35 U.S.C. § 103(a) WITH RESPECT TO CLAIMS 8-14, 21-27, 35-46, 50-53 AND 60**

Claims 8-14, 21-27, 35-46, 50-53 and 60 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,343,207 B1 ("Hessel") in view of U.S. Patent No. 5,745,523 ("Dent") and further in view of U.S. Patent No. 5,283,484 ("Brehmer"). Applicants respectfully traverse the rejection.

Applicants respectfully submit that Hessel, Dent and Brehmer, individually or combined, do not teach each and every element as set forth in claims 8-14, 21-27, 35-46, 50-53 and 60.

For example, with respect to independent claim 1, the Office Action at page 2 alleges that "first and second digitally tunable filters" are compensation finite impulse response (CFIR) filters 172I,Q as set forth in Hessel. However, claims 8-14 which depend from claim 1, recite, either directly or indirectly through dependence, that the first filter comprises a first tunable capacitor and that the second filter comprises a second tunable capacitor. Thus, according to the logical arguments set forth in the Office Action, the CFIR filters 172I,Q, as set forth in Hessel, each must comprise a tunable capacitor. Neither Hessel, Dent nor Brehmer, individually or combined, teaches a CFIR filter, as set forth in Hessel, comprising a tunable capacitor. Furthermore, a tunable capacitor as part of a CFIR filter is not enabled by the teachings of the combination of Hessel, Dent and Brehmer.

Similarly, with respect to independent claims 15, 28, 47 and 54, the Office Action alleges that "first and second digitally tunable filters" are CFIR filters 172I,Q as set forth in Hessel. See

Office Action at pages 4, 6, 9 and 10. However, claims 21-27, 35-46, 50-53 and 60 which depend from claims 15, 28, 47 and 54, respectively, recite, either directly or indirectly through dependence, that the first filter comprises a first tunable capacitor and that the second filter comprises a second tunable capacitor. Thus, according to the logical arguments set forth in the Office Action, the CFIR filters 172I,Q each must comprise a tunable capacitor. Neither Hessel, Dent nor Brehmer, individually or combined, teaches a CFIR filter comprising a tunable capacitor. Furthermore, a tunable capacitor as part of a CFIR filter is not enabled by the teachings of the combination of Hessel, Dent and Brehmer.

In addition, the arguments made below with respect to independent claims 1, 15, 28, 47 and 54 with respect to the combined teachings of Hessel and Dent are also made here with respect to respective dependent claims 8-14, 21-27, 35-46, 50-53 and 60 with respect to the combined teachings of Hessel and Dent in view of Brehmer. Accordingly, the obviousness rejection based on the combination of Hessel, Dent and Brehmer cannot be maintained.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to claims 8-14, 21-27, 35-46, 50-53 and 60.

#### CONSIDERING EACH AND EVERY ELEMENT OF CLAIMS

Applicants respectfully submit that, by grouping claim 8-14, for example, as merely comprising "a first resistor and a first tunable capacitor; and a second resistor and a second tunable capacitor, the control logic digitally tuning the first and second capacitors", the Office Action has not adequately considered each and every element as set forth in claims 8-14.

Applicants respectfully request that the subsequent Office Action deal with claims 8-14 individually. For example, claim 9 recites "wherein the control logic digitally tunes each of the first and second capacitors by providing a first digital word to the first capacitor and a second digital word to the second capacitor". Clearly, claim 9 recites more than just a first capacitor and a second capacitor. In another example, claim 10 recites "wherein the control logic tunes initially tunes the first capacitor to a first value and tunes the second capacitor to a second value different from the first value, and wherein the control logic is disabled when the first digital word equals the second digital word". Clearly, claim 10 recites more than just a first capacitor and a second capacitor. In yet another example, claim 11 recites "wherein the first value comprises a maximum value of the first capacitor and the second value comprises a minimum value of the

second capacitor". Clearly, claim 11 recites more than just a first capacitor and a second capacitor. In yet still another example, claim 12 recites "wherein the first capacitor comprises a first tunable capacitor array and the second capacitor comprises a second tunable capacitor array". Clearly, claim 12 recites more than just a first capacitor and a second capacitor. Claim 13 recites "wherein the first and second tunable capacitor arrays each comprises a plurality of capacitors coupled in parallel, and a plurality of switches each being coupled in series to a different one of their respective capacitors". Clearly, claim 13 recites more than just a plurality of capacitors. Claim 14 recites that "the control logic tunes the first filter with a plurality of first digital bits and tunes the second filter with a plurality of second digital bits, the first digital bits each controlling a different one of the switches in the first capacitor array and the second digital bits each controlling a different one of the switches in the second capacitor array". The additional elements and details are not discussed in the Office Action and thus the Office Action has failed to present even a prima facie case of obviousness.

Applicants respectfully submit that the other claims (i.e., the claims other than claims 8-14) which were rejected "under a similar rationale" be reconsidered individually.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to claims 8-14, 21-27, 35-46, 50-53 and 60.

### **III. REJECTION UNDER 35 U.S.C. § 103(a) WITH RESPECT TO CLAIMS 1-7, 15-20, 28-34, 47-49, 54-59 AND 61**

Claims 1-7, 15-20, 28-34, 47-49, 54-59 and 61 stand rejected under 35 U.S.C. § 103(a) as being obvious over Hessel in view of Dent. Applicants respectfully traverse the rejection.

#### **A. Claims 54-59 and 61**

Neither Hessel nor Dent, individually or combined, teaches each and every element as set forth in claim 54. For example, claim 54 recites "providing a reference signal to first and second digitally tunable filters; and digitally tuning the first and second filters as a function of a first parameter of the filtered reference signal output from the first filter and a second parameter of the filtered reference signal output from the second filter".

The Office Action at page 10 alleges that the "first and second digitally tunable filters" are CFIR filters 172I,Q as set forth in Hessel. Furthermore, the Office Action at page 10 alleges

that Hessel teaches "providing a reference signal to first and second digitally tunable filters". Thus, according to the logical arguments as set forth in the Office Action, a reference signal is provided to the CFIR filters 172I,Q. Applicants respectfully submit that Hessel does not teach providing a reference signal to the CFIR filters 172I,Q. Furthermore, the teach deficiencies of Hessel are not made up by the teachings of Dent. Neither Hessel nor Dent, individually or combined, teaches providing a reference signal to a CFIR filter as alleged in the arguments as set forth in the Office Action. For at least the above reasons, claims 54-59 and 61 are not rendered obvious over Hessel in view of Dent.

Since the Office Action uses many of the same or similar arguments in support of the rejection of claim 54 as were used in support of the rejection of claim 1, Applicants respectfully make the same or similar arguments in traversing the rejection of claim 54 as will be made below in traversing the rejection of claim 1.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to independent claim 54 and its dependent claims (i.e., claims 55-59 and 61).

**B. Claims 1-7**

Neither Hessel nor Dent, individually or combined, teaches each and every element as set forth in claim 1. For example, claim 1 recites "first and second digitally tunable filters; and control logic to digitally tune the first and second filters as a function of a first parameter of a first signal output from the first filter and a second parameter of a second signal output from the second filter". The Office Action alleges that the first and second digitally tunable filters are CFIR filters 172I,Q as set forth in Hessel. Office Action at page 2.

Finite-duration, impulse-response (FIR) filters are also generally known as non-recursive filters because there is no feedback of past outputs to form a present output. Hessel supports this interpretation of a FIR filter.

In the receive mode, as illustrated in FIG. 38, the compensating CFIR filter 172 shall be a fixed coefficient, decimate by two FIR filter that compensates for the Sinc passband characteristics of the CIC filter 170. . . . In the Transmit mode, as illustrated in FIG. 39, the CFIR filter 184 shall be a fixed coefficient, interpolate by two FIR filter that compensates for the Sinc passband characteristics of the CIC filter 180.

Hessel at col. 22, lines 59-62 and lines 64-69. See also, e.g., Hessel at FIGS. 38 and 39. Thus, it appears that Hessel only teaches "fixed coefficient" FIR filters 172.

If each FIR filter 172 only has a "fixed coefficient" as stated in Hessel, then how can the Office Action justify modifying the fixed-coefficient FIR filter 172 as taught by Hessel with "control logic to digitally tune the first and second filters as a function of a first parameter of a first signal output from the first filter and a second parameter of a second signal output from the second filter". In other words, if the FIR filter 172 has a fixed coefficient as taught by Hessel, then why would Hessel even need control logic for the fixed-coefficient FIR filters 172. To tune digitally as a function of a first parameter of a first signal output from a first filter and a second parameter of a second signal output from a second filter is not desired when the coefficients are fixed as appears to be the case in FIR filters 172 of Hessel. After all, fixed coefficients do not need tuning. In this case, tuning is the opposite of fixed. In other words, in this case, tuning teaches away from fixed.

Applicants respectfully submit that the fixed-coefficient FIR filters 172 of Hessel as alleged by the Examiner and described in Hessel teach away from the tuning digitally of Dent as alleged by the Examiner. Under such circumstances, M.P.E.P. § 2145(X)(D)(2) concludes that "[i]t is improper to combine references where the references teach away from their combination". Furthermore, since Hessel teaches a fixed-coefficient FIR filter 172, the Examiner's proposed modification of Hessel's fixed coefficient FIR filter 172 in view of the digitally tuning of Dent as alleged by the Examiner, would necessarily change the principle of operation of fixed-coefficient FIR filter 172 which is prohibited under M.P.E.P. § 2143.01.

The Office Action at page 2 states that "Hessel et al does not specifically disclose the feature of a control logic to digitally tune the first and second filters as a function of a first parameter of a first signal output from the first filter and a second parameter of a second signal output from the second filter". Then the Office Action at page 3 then generally describes the alleged teachings of Dent and cites Dent at col. 5, lines 1-42; col. 7, lines 33-67; col. 15, line 6 to col. 16, line 16; col. 19, lines 3-19; col. 10, lines 15-47; col. 11, lines 51 to col. 12, line 38; col. 14, lines 36-55; and FIGS. 1, 2 and 9. In the general description of Dent, "control logic" is never once identified. Applicants are left to merely guess at the Examiner's characterization of "control logic" in Dent.

Applicants respectfully implore the Examiner to kindly identify, in a subsequent office action, the "control logic" of Dent that the Examiner is alleging is the "control logic" as set forth in claim 1.

To repeat, Applicants respectfully request that the Examiner identify the component and reference number of the "logic control" in Dent.

Applicants respectfully acknowledge that "[t]he examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness". M.P.E.P. § 2142.

Accordingly, an obviousness rejection based on Hessel in view of Dent cannot be maintained with respect to claim 1 and its dependent claims (i.e., claims 2-7).

**C. Claims 15-20**

Neither Hessel nor Dent, individually or combined, teaches each and every element as set forth in claim 15. For example, claim 15 recites "first and second digitally tunable filters; and tuning means for digitally tuning the first and second filters as a function of a first parameter of a first signal output from the first filter and a second parameter of a second signal output from the second filter". Since the Office Action uses many of the same or similar arguments in support of the rejection of claim 15 as were used in support of the rejection of claim 1, Applicants respectfully make the same or similar arguments in traversing the rejection of claim 15 as were made in traversing the rejection of claim 1.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to independent claim 15 and its dependent claims (i.e., claims 16-20).

**D. Claims 28-34**

Neither Hessel nor Dent, individually or combined, teaches each and every element as set forth in claim 28. For example, claim 28 recites "a calibration circuit having first and second digitally tunable filters, and control logic having a tuning output to digitally tune the first and second filters as a function of a first parameter of a first signal output from the first filter and a second parameter of a second signal output from the second filter". Since the Office Action uses many of the same or similar arguments in support of the rejection of claim 28 as were used in

support of the rejection of claim 1, Applicants respectfully make the same or similar arguments in traversing the rejection of claim 28 as were made in traversing the rejection of claim 1.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to independent claim 28 and its dependent claims (i.e., claims 29-34).

**E. Claims 47-49**

Neither Hessel nor Dent, individually or combined, teaches each and every element as set forth in claim 47. For example, claim 47 recites "first and second digitally tunable filters each having a tuning input" and "control logic having an input coupled to the output of the comparator, and a first tuning output coupled to the tuning input of the first filter and a second tuning output coupled to the tuning input of the second filter". Since the Office Action uses many of the same or similar arguments in support of the rejection of claim 47 as were used in support of the rejection of claim 1, Applicants respectfully make the same or similar arguments in traversing the rejection of claim 47 as were made in traversing the rejection of claim 1.

For at least the above reasons, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to independent claim 47 and its dependent claims (i.e., claims 48 and 49).

**IV. CONCLUSION**

In view of at least the foregoing, it is respectfully submitted that the pending claims 1-68 are in condition for allowance. Should anything remain in order to place the present application in condition for allowance, the Examiner is kindly invited to contact the undersigned at the below-listed telephone number.

Please charge any required fees not paid herewith or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

Dated: May 11, 2005

Respectfully submitted,



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